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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,134	12/01/2004	Stephen Lee Davis	46096-17	7377

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BENNETT JONES
C/O MS ROSEANN CALDWELL
4500 BANKERS HALL EAST
855 - 2ND STREET, SW
CALGARY, AB T2P 4K7
CANADA

EXAMINER	
WU, IVES J	

ART UNIT	PAPER NUMBER
1797	

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11/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/500,134	DAVIS ET AL.	
	Examiner	Art Unit	
	Ives Wu	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-2,4-12,51-64,79-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2,4-12,51-64,79-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

(1). Applicants' Amendments and Remarks filed on 10/11/2007 have been received.

Claims 1 is amended. Claims 3, 13-50 and 65-78 are cancelled.

Claims 79-82 are newly added.

Accordingly, the 112 2nd rejections for claims 3, 19-32, 66, 68 in prior Office Action dated 04/17/2007 are removed.

The 112 2nd rejections for claims 33-50 and 69-78 in prior Office Action dated 04/17/2007 are removed.

The rejections of claims 3, 13-50 and 65-78 in prior Office Action dated 04/17/2007 are removed.

A new ground of rejections for claims 1-2, 4-12, 51-64 and 79-82 is introduced in the following.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(2). **Claims 1-2, 4-12, 51-64** and **79-82** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumotot et al (US05231063A) in view of Miller (US05700438A).

As to sulphuric acid at between about 0.1 to *4 % by vol.* of solution in a solution for removing a sulphur compound or carbon dioxide from a fluid in **independent claim 1**,

Fukumoto et al (US005231063A) disclose composite adsorbent for removing hydrogen sulfide (Abstract). The composite adsorbent comprises an acid salt of an m- or p-aromatic amino acid and an acid (Abstract, line 1-2). The acid includes inorganic acids such as sulfuric acid (Col. 3, line 22-24). In Table 1, Sample No. 3, the sulfuric acid is calculated approximately 7.7 wt% of the solution. Fukumoto et al further disclose, for a better effect, they may be used in the form of solution in an adequate concentration (Col. 3, line 44-45), in the absence of showing criticality of the records, the optimized range of about 0.1 to 4 vol. % of sulfuric acid in the solution in a known process renders *prima facie obviousness* within one of ordinary skills in the art. *In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).*

As to a metal, at between about 0.05 to 10 wt% of the solution in a solution for removing a sulphur compound or carbon dioxide from a fluid in **independent claim 1**, Fukumoto et al (US005231063A) disclose the adsorbent may further containing a transition metal compound (Abstract, line 2-3). In Table 1, Sample No. 3, the metal (Cupric) is calculated approximately 1.6 wt% of the solution.

As to water in a solution for removing a sulphur compound or carbon dioxide from a fluid in **independent claim 1**, Fukumoto et al (US005231063A) disclose water component in the Examples.

As to an amine, at between about 10 to 80 vol% of the solution for removing a sulphur compound or carbon dioxide from a fluid in **independent claim 1**, Fukumoto et al (US005231063A) disclose acid salt of an m- or p-aromatic amino acid (Abstract, line 1-2). Fukumoto et al **do not teach** amine as claimed.

However, Miller (US005700438A) **teaches** water soluble amine (Abstract, line 3-4).an important feature of the invention is that amount of amine in relation to the source of copper used to make the amine complex is such that there is present in such solutions between 0.05 to 5 moles of amine (Col. 3, line 55-58). The use of Tris in amount ranging between 0.1 to 4 moles would reads on the volumetric range as claimed.

The advantage of using water soluble amine is to form stable copper complexs yet at the same time be incapable of forming complexes with copper sulfides (Col. 3, line 20-22). Also it is well known in the art that amine based system is used to remove acidic gas component.

Therefore, it would have been obvious at time of the invention to include water soluble amine disclosed by Miller in the composite adsorbent of Fukumoto et al in order to obtain the above-mentioned advantages.

As to limitation of **claim 2**, Fukumoto et al disclose the removal of hydrogen sulfide, methyl mercaptan (Col. 2, line 37-40).

As to limitation of **claims 4-6**, Fukumoto et al disclose copper, zinc, iron and managanese (Col. 3, line 37-38).

As to limitation of **claims 7-8**, Miller discloses examples of water-soluble amines including methyl amine, monoethanol amine (Col. 3, line 32-60).

As to mixture of amine in **claim 9**, it would be obvious to one having ordinary skill I the art at the time the invention was made to use amine mixtures since each member of the combination is known individually as an effective amine and the person of ordinary skill in the art would have expected such a combination to work in an additive or cumulative manner. *In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).*

As to limitation of **claims 10-12**, Fukumoto et al disclose, for a better effect, they may be used in the form of solution in an adequate concentration (Col. 3, line 44-45), in the absence of showing criticality of the records, the optimized range of about 0.1 to 2 vol% of sulfuric acid, about 1 to 5 wt% of metal content, about 25 to 50 vol% of amine in the solution in a known process renders *prima facie obviousness* within one of ordinary skills in the art. *In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).*

As to solution in a method of removing a sulphur compound or carbon dioxide from a fluid in **independent claim 51**, the disclosure of Fukumoto et al, Miller is incorporated herein by reference, the most subject matters of solution as currently claimed, have been recited in any one applicants' previous claims 1-2, 4-12, and have been discussed therein.

As to the step of preparing a solution in a method in **independent claim 51**, Fukumoto et al disclose the Example 1 for the preparation of such solution.

As to the step of contacting a solution with a fluid in a method in **independent claim 51**, Fukumoto et al disclose the Example 1 for the test of such solution by contacting with such fluid.

As to limitation of **claim 52**, Fukumoto et al disclose the removal of hydrogen sulfide, methyl mercaptan (Col. 2, line 37-40).

As to the fluid to be gas in **claim 53**, fluid to be air in **claim 56**, Fukumoto et al disclose the composite adsorbent effectively removing various offensive odors originating fro industrial and automotive exhaust gas and other smells of tobacco, human body, human waste, food etc. encountered in daily life (Col. 1, line 7-12).

As to limitations of **claims 54, 57-58**, in view of substantially identical solution disclosed by prior arts, and applicants, it would be obvious to treat the liquid fluids such as liquid hydrocarbon, drilling mud as evidenced by Stark (US002723221) that use of chelating agents to improve acid treatment of hydrocarbon streams (Title). Some of these hydrocarbon streams include crude residuums or bottoms from the distillation of crude petroleum, lubricating oil distillate stocks, paraffinic or naphthenic oil fractions produced by the selective solvent extraction of lubricating oil distillates or reduced crudes, viscous hydrocarbon oils resulting from the destructive or non-destructive hydrocarbon of crude oil or fractions thereof, and tar or tar distillates obtained in the cracking of petroleum for the production of motor fuel (Col. 2, line 5-13).

As to the gas to be natural gas in **claim 55**, Miller discloses removal of H_2S in the natural gas (Col. 1, line 15-17).

As to limitation of **claims 59-60**, in view of substantially identical solution disclosed by Fukumoto et al, Miller, and by applicants, it would be obvious to practice the solution of prior arts at temperature ranged from 0 – 51.°C and –10 to –40 °C for the reasons of enhancing the adsorbing selectivity and saving energy as evidenced by Gazzi et al (US004971607) that the cryogenic process for removal of acidic gases mixture at temperature in the range of –100 to 10 °C (Col. 5, line 6-15).

As to the method in **independent claim 61**, the disclosure of Fukumoto et al, Miller is incorporated herein by reference, the most subject matters of solution, steps as currently claimed, have been recited in any one applicants' previous claims 51, and have been discussed therein.

As to the temperature range performed in the method between 0 to -51 °C in **independent claim 61**, the disclosure of Fukumoto et al, Miller, Gazzi et al is incorporated

herein by reference, the most subject matter as currently claimed, has been recited in applicants' claim 59, and has been discussed therein.

As to temperature range from –10 to –40 °C in **claim 62**, from –20 to –40 °C in **claim 63**, from –10 to –30 °C in **claim 64**, in the absence of showing criticality of the records, the optimized temperature range of –10 to –40 °C, -20 to –40 °C, from –10 to –30 °C in a known process renders *prima facie obviousness* within one of ordinary skills in the art. *In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).*

As to sulphuric acid to be present at between about 1 to 4 vol. % of the solution in **claim 79**, about 2 vol. % of the solution in **claim 80**, about 2.3 vol. % in **claim 81**, Fukumoto et al disclose, for a better effect, they may be used in the form of solution in an adequate concentration (Col. 3, line 44-45), in the absence of showing criticality of the records, the optimized range of about 1 to 4 vol %, 2 vol. %, 2.3 vol. %, of sulfuric acid in the solution in a known process renders *prima facie obviousness* within one of ordinary skills in the art. *In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).*

As to the pH of the solution between about 8 and 12 in **claim 82**, in view of substantially identical solution disclosed by prior arts and by applicants, it is examiner's position to believe that the solution of prior arts would inherently possess the pH between about 8 to 12 as claimed. Since USPTO does not have proper means to conduct the experiments, the burden now is shifted to applicants to prove otherwise. *In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977).*

Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu
Art Unit: 1797
Date: November 26, 2007

DUANE SMITH
PRIMARY EXAMINER

11-26-07